

Sum rules for the Gravitational Form Factors in light-front dressed quark model

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First, we give a brief overview of the light-front dressed quark model, per se, instead of a proton state, we use a simple composite spin-1/2 state that is a quark dressed with a gluon. It is a perturbative model and has gluonic degrees of freedom. Then we outline the formalism used to evaluate the gravitational form factors (GFFs) of quarks and gluons in a dressed quark model. We use the Hamiltonian framework and choose the light-front gauge such that the two-component formalism eliminates the constraint fields. We calculate the four GFFs and corroborate the sum rules that GFFs satisfy. Of the four GFFs, the D-term as we know is not related to any Poincare generator so it remains unconstrained. This D-term is attributed to information like pressure, shear, and energy distributions. So, we analyze these distributions for a quark state dressed with a gluon at one loop in QCD.

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